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GROWTH POISONING SEWER JOINT

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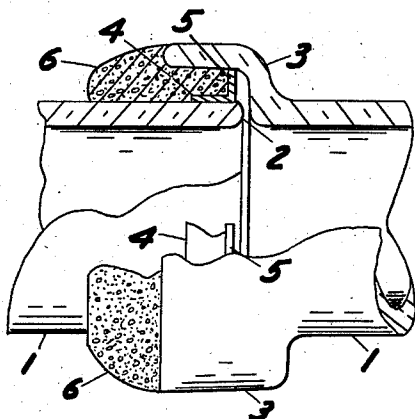


Fig. I

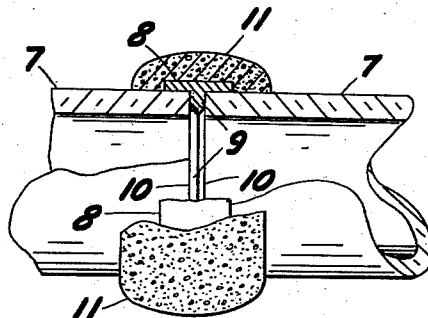


Fig. II

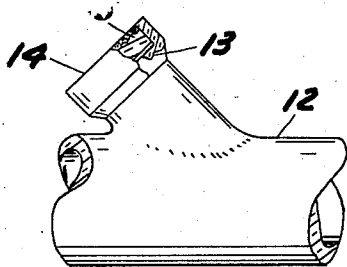


Fig. III

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## UNITED STATES PATENT OFFICE

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## GROWTH POISONING SEWER JOINT

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2 Claims. (Cl. 285—115)

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This invention relates to promoting permanency in initial upkeep conditions of drains, sewers and the like, more particularly as against growth attack.

This invention has utility when incorporated in duct, sewer pipe, or tile aligned joint connections, wherein there is metallic copper interior exposure, responding in moisture attack with copper salt corrosion reaction in any tendency for out seepage to tend to inhibit growth attack by permeating the cement packing for the joint. Joint attacking growths, such as roots, do not approach the duct in the region of this protective root-poisoning impregnated joint. Accordingly, any minute initial crevice therein, is not pried open by a root growth, to fracture the cement and thereby establish entrance of the root to clog the drain.

Referring to the drawings:

Fig. 1 is a side elevation, partially in section, of a bell joint type of sewer or hard tile joint, having an embodiment of the invention incorporated therewith;

Fig. 2 is a side elevation of a soft tile joint, with parts broken away, showing how an embodiment of the invention is adapted to this drain duct, and

Fig. 3 is a sewer branch duct seal embodiment. Glazed or vitrified finish, so-called hard tile, more particularly as municipally approved for sewer and drain use, may comprise tubular sections 1 with a straight end 2 of one thereof nesting into a bell end 3 of the adjacent section 1. There is some looseness of fit between the straight end 2 and the interior of the bell 3, even for the common internal diameter tile. The result is that accuracy in alignment between the sections is difficult. The internal offset resulting from the out-of-alignment provides a ledge or obstruction to promote sewer clogging and weaken the joint.

In an embodiment of practice under the invention herein disclosed, a material step forward is taken to avoid the out-of-alignment bugaboo in sewer laying practice. To this end a thin metallic copper sleeve or ring 4, of relatively soft characteristic, is slipped over the tile end 2 with an outwardly extending integral flange 5 from the sleeve portion 4. This inter-fitting of the sleeve 4 on the duct 1 is not so snug as to require strain or rupture of the sleeve 4. However, it is desirable that the sleeve ride to its position nicely. As entering the bell 3 of the next section 1, there may be a slight inward crowding tendency radially of the flange 5.

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However, here too there should be sufficient give in the flange 5 radially not to buckle, but to enhance the snug fitting between the end 2 and the sleeve 4.

From the foregoing, it is to be noted that there may be some looseness of fitting between the bell 3 and the end 2 for the flanged sheet copper sleeve ring 4, 5. The flange 5 insures alignment initial establishment between the sections 1 at the joint 2, 3, therebetween. From this it follows there is sewer duct interior smoothness continuity therepast.

To supplement the holding assembly of the joint, a cement packing to overflow the bell end is adopted. An efficient mixture of hold-up value in practice comprises three parts of Portland cement to one of sand, well mixed and packed into the clearance about the section 1 into the bell 3 for concealing and lodging fully over the copper ring 4, 5. The wet mix adopted is not so thin as to run thru past the copper ring 4, 5. Upon setting, a hard cement filler 6 completes the joint for permanency maintenance.

Initially, the exposed portion of the cement 6 has the normal gray color of the cement and sand of its ingredients. Notwithstanding the glazed finish on the sewer duct tiles of the end 2 and the bell 3, the cement has a clinging or bonding adherence or integral characteristic in the assembly.

Almost universally, sewer tile are embedded in soil, and therefrom there should be minimum of weathering attack, especially from expansion and contraction due to temperature changes. So much for the exterior factors to be met. The purpose of the sewer being a drain, it provides a way or take-off for widely different characters of fluids or flowing materials, and at out-of-season temperature extremes, even to ice, steam, and chemical attacking agents of acid, alkali and solvent traits. The vitrified lining of the duct is normally resistant. There is no obstruction into the duct way as aligned with the joint herein disclosed. Due to the fact of sewers being largely carriers of moisture, any joint seepages attract moisture-seeking root approach, with even sewer entrance in their moisture-pick-up greed.

The metallic copper herein is of such light gage that there is no physical strain given the joint when there be temperature extreme exposures. In providing the dam or protective diaphragm between the cement and the sewer flow stream, there may be chemical attack on the copper, which is outward as to capillarity or

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more open seepage. Accordingly, as there be developed any pores or voids in the cement of the joint, this cement 6 is automatically and at once impregnated with an inhibitor as to root growths. Upon accumulation of the attacks over a considerable period, slight to more or less, and sometimes localized, stains may develop in the exposed portion of the cement 6 of the joint. This is evidenced by a greenish tinge as of verdigris. The physical strength of the joint 6 is not impaired. Roots do not approach to wedge or open what may be initially minute capillary ducts. The green does not superficially appear as a crumbly mass of salt crystals. Otherwise than the slight color change, the joint retains the appearance as when placed.

In some localities, there is the practice of placing unglazed straight or unbelled, so-called soft tile 7 about foundation walls, while the large use of this tile is for field drainage. Whether at a foundation, or even in field drainage, where there is vicinity where tile conducted moisture may entice root growth to enter and so clog that drain purpose is entirely defeated, the foresighted individual may with advantage adopt root inhibitor tactics under the invention herein. As with the glazed sewer tile, alignment may be promoted between the sections 7 of the soft tile by a sleeve 8 of thin sheet copper. Preferably, this sleeve 8, intermediate its length has an inward flange 9 as a spacer between ends 10 of the tile 7. This in-flange 9, is of less extent than the thickness of the tile 7, so that as the tile ends 10 abut, there is no protusion of the flange 9 inward therebeyond. With the flange 9 medially of the length of the sleeve 8, the projecting portions of the sleeve 8 each way therefrom over the outer side of the adjacent tile ends 10, insures internal alignment of the tile with a resulting smooth interior way at the joint. Enveloping the sleeve 8 as a seal, there may be a cement mix envelope 11, say of three parts Portland cement and one part sand. The sleeve 8 is preferably not so loose that the mix of the cement 11 may flow past the sleeve into the tile interior.

The tile 7 in serving its purpose to carry off moisture, may have the moisture directly contact the copper flange 9. Any disintegration thereof, toward outward seepage, thus poison-

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charges moisture escape. Any root growths in the vicinity adopt fleeing direction, thereby allowing the joint to retain its form against such wedging and clogging attacks.

Main sewer Y-branches 12, may have copper disk 13 fitted in the bell 14 to be so held by clay or cement packing or filter 15, with a central handle outward. The metallic copper here assures from root disturbance. For the seal protection against growth, the metal 4, 5; 8, 9; 13, in its corrosion, whether copper, zinc, or alloy, even including arsenic and or antimony, is to have poison diffusion property.

What is claimed and it is desired to secure by Letters Patent is:

1. A duct drain section bell end providing an opening, a complementary drain section having an end thereof in the bell, an endless copper ring having a cylindrical sleeve portion extending from a radial flange, said ring in its endless extent having snug bearing with one of the sections at the sleeve portion and snug bearing contact with the other section at said flange thereby to form a tight seal between the sections, and a sealing cement of greater radial thickness than the ring flange, said cement extending into the bell covering the ring and providing ring-concealing reinforcement.

2. A pair of duct sections, a copper sleeve extending from a radial flange, said sleeve having snug endless bearing engagement forming a tight seal between the sections, said sleeve having endless seat portions engaging the respective sections to hold the sections in alignment, and a sleeve enveloping reinforcement cement seal bonding the sections together in addition to the sleeve.

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